

skills. In addition, an increasing number of adults are participating in classes for personal enrichment and enjoyment. Enrollment in adult basic education and literacy programs is increasing because of changes in immigration policy that require basic competency in English and civics. And, more employers are demanding higher levels of basic academic skills—reading, writing, and arithmetic—which is increasing enrollment in remedial education and GED preparation classes.

Employment growth of adult vocational-technical education teachers will result from the need to train young adults for entry-level jobs. Experienced workers who want to switch fields or whose jobs have been eliminated due to changing technology or business reorganization also require training. Businesses are finding it essential to provide training to their workers to remain productive and globally competitive. Cooperation between businesses and educational institutions continues to increase to insure that students are taught the skills employers desire. This should result in greater demand for adult and vocational education teachers, particularly at community and junior colleges. Since adult education programs receive State and Federal funding, employment growth may be affected by government budgets.

Additional job openings for adult and vocational education teachers will stem from the need to replace persons who leave the occupation. Many teach part time and move into and out of the occupation for other jobs, family responsibilities, or retirement.

Earnings

Median annual earnings of adult education teachers were \$24,800 in 1998. The middle 50 percent earned between \$18,170 and \$34,140. The lowest 10 percent earned less than \$13,080 and the highest 10 percent earned more than \$47,430. Median annual earnings in the industries employing the largest numbers of adult education teachers in 1997 were:

Elementary and secondary schools	\$29,900
Colleges and universities	25,900
Schools and educational services, not elsewhere classified	24,600
Dance studios, schools, and halls	23,600
Individual and family services	19,400

Median annual earnings of vocational education teachers were \$34,430 in 1998. The middle 50 percent earned between \$24,890 and \$45,230. The lowest 10 percent earned less than \$18,010 and the highest 10 percent earned more than \$63,850. Median annual earnings in the industries employing the largest numbers of vocational education teachers in 1997 were:

State government, except education and hospitals	\$37,200
Elementary and secondary schools	37,000
Colleges and universities	34,800
Vocational schools	32,600
Schools and educational services, not elsewhere classified	24,700

Earnings varied widely by subject, academic credentials, experience, and region of the country. Part-time instructors usually are paid hourly wages and do not receive benefits or pay for preparation time outside of class.

Related Occupations

Adult and vocational education teaching requires a wide variety of skills and aptitudes, including the ability to influence, motivate, train, and teach; organizational, administrative, and communication skills; and creativity. Workers in other occupations that require these aptitudes include other teachers, counselors, school administrators, public relations specialists, employee development specialists, and social workers.

Sources of Additional Information

Information on adult basic education programs and teacher certification requirements is available from State departments of education and local school districts.

For information about adult vocational-technical education teaching positions, contact State departments of vocational-technical education.

For information on adult continuing education teaching positions, contact departments of local government, State adult education departments, schools, colleges and universities, religious organizations, and a wide range of businesses that provide formal training for their employees.

General information on adult and vocational education is available from:

☛ Association for Career and Technical Education, 1410 King St., Alexandria, VA 22314. Internet: <http://www.acteonline.org>

☛ ERIC Clearinghouse on Adult, Career, and Vocational Education, 1900 Kenny Rd., Columbus, OH 43210-1090. Internet: <http://www.ericacve.org>

Archivists, Curators, Museum Technicians, and Conservators

(O*NET 31511A, 31511B, 31511C, and 31511D)

Significant Points

- Employment usually requires graduate education and related work experience.
- Keen competition is expected because qualified applicants outnumber the most desirable job openings.

Nature of the Work

Archivists, curators, museum and archives technicians, and conservators search for, acquire, appraise, analyze, describe, arrange, catalogue, restore, preserve, exhibit, maintain, and store valuable items that can be used by researchers or for exhibitions, publications, broadcasting, and other educational programs. Depending on the occupation, these items include historical documents, audiovisual materials, institutional records, works of art, coins, stamps, minerals, clothing, maps, living and preserved plants and animals, buildings, computer records, or historic sites.

Archivists and curators plan and oversee the arrangement, cataloguing, and exhibition of collections and, along with technicians and conservators, maintain collections. Archivists and curators may coordinate educational and public outreach programs, such as tours, workshops, lectures, and classes, and may work with the boards of institutions to administer plans and policies. They also may research topics or items relevant to their collections. Although some duties of archivists and curators are similar, the types of items they deal with differ. Curators usually handle objects found in cultural, biological, or historical collections, such as sculptures, textiles, and paintings, while archivists mainly handle valuable records, documents, or objects that are retained because they originally accompanied and relate specifically to the document.

Archivists determine what portion of the vast amount of records maintained by various organizations, such as government agencies, corporations, or educational institutions, or by families and individuals, should be made part of permanent historical holdings, and which of these records should be put on exhibit. They maintain records in their original arrangement according to the creator's organizational scheme, and describe records to facilitate retrieval. Records may be saved on any medium, including paper, film, videotape, audiotape, electronic disk, or computer. They also may be copied onto some other format to protect the original, and to make them more accessible to researchers who use the records. As computers and various

storage media evolve, archivists must keep abreast of technological advances in electronic information storage.

Archives may be part of a library, museum, or historical society, or may exist as a distinct unit within an organization or company. Archivists consider any medium containing recorded information as documents, including letters, books, and other paper documents, photographs, blueprints, audiovisual materials, and computer records. Any document that reflects organizational transactions, hierarchy, or procedures can be considered a record. Archivists often specialize in an area of history or technology so they can better determine what records in that area qualify for retention and should become part of the archives. Archivists also may work with specialized forms of records, such as manuscripts, electronic records, photographs, cartographic records, motion pictures, and sound recordings.

Computers are increasingly used to generate and maintain archival records. Professional standards for use of computers in handling archival records are still evolving. However, computers are expected to transform many aspects of archival collections as computer capabilities, including multimedia and worldwide web use, expand and allow more records to be stored and exhibited electronically.

Curators oversee collections in museums, zoos, aquariums, botanical gardens, nature centers, and historic sites. They acquire items through purchases, gifts, field exploration, inter-museum exchanges, or, in the case of some plants and animals, reproduction. Curators also plan and prepare exhibits. In natural history museums, curators collect and observe specimens in their natural habitat. Their work involves describing and classifying species, while specially trained collection managers and technicians provide hands-on care of natural history collections. Most curators use computer databases to catalogue and organize their collections. Many also use the Internet to make information available to other curators and the public. Increasingly, curators are expected to participate in grant writing and fund raising to support their projects.

Most curators specialize in a field, such as botany, art, paleontology, or history. Those working in large institutions may be highly specialized. A large natural history museum, for example, would employ specialists in birds, fishes, insects, and mollusks. Some curators maintain the collection, others do research, and others perform administrative tasks. Registrars, for example, keep track of and move objects in the collection. In small institutions, with only one or a few curators, one curator may be responsible for multiple tasks, from maintaining collections to directing the affairs of museums.

Conservators manage, care for, preserve, treat, and document works of art, artifacts, and specimens. This may require substantial historical, scientific, and archaeological research. They use X-rays, chemical testing, microscopes, special lights, and other laboratory equipment and techniques to examine objects and determine their condition, the need for treatment or restoration, and the appropriate method for preservation. They then document their findings and treat items to minimize deterioration or restore items to their original state. Conservators usually specialize in a particular material or group of objects, such as documents and books, paintings, decorative arts, textiles, metals, or architectural material.

Museum directors formulate policies, plan budgets, and raise funds for their museums. They coordinate activities of their staff to establish and maintain collections. As their role has evolved, museum directors increasingly need business backgrounds in addition to an understanding of the subject matter of their collections.

Museum technicians assist curators and conservators by performing various preparatory and maintenance tasks on museum items. Some museum technicians may also assist curators with research. Archives technicians help archivists organize, maintain, and provide access to historical documentary materials.



Archivists, curators, museum technicians, and conservators sometimes conduct research relevant to their collections.

Working Conditions

The working conditions of archivists and curators vary. Some spend most of their time working with the public, providing reference assistance and educational services. Others perform research or process records, which often means working alone or in offices with only a few people. Those who restore and install exhibits or work with bulky, heavy record containers may climb, stretch, or lift. Those in zoos, botanical gardens, and other outdoor museums or historic sites frequently walk great distances.

Curators who work in large institutions may travel extensively to evaluate potential additions to the collection, organize exhibitions, and conduct research in their area of expertise. However travel is rare for curators employed in small institutions.

Employment

Archivists, curators, museum technicians, and conservators held about 23,000 jobs in 1998. About a quarter were employed in museums, botanical gardens, and zoos, and approximately 2 in 10 worked in educational services, mainly in college and university libraries. Over one-third worked in Federal, State, and local government. Most Federal archivists work for the National Archives and Records Administration; others manage military archives in the Department of Defense. Most Federal Government curators work at the Smithsonian Institution, in the military museums of the Department of Defense, and in archaeological and other museums managed by the Department of Interior. All State governments have archival or historical records sections employing archivists. State and local governments have numerous historical museums, parks, libraries, and zoos employing curators.

Some large corporations have archives or records centers, employing archivists to manage the growing volume of records created or maintained as required by law or necessary to the firms' operations. Religious and fraternal organizations, professional associations, conservation organizations, major private collectors, and research firms also employ archivists and curators.

Conservators may work under contract to treat particular items, rather than as a regular employee of a museum or other institution. These conservators may work on their own as private contractors, or as an employee of a conservation laboratory or regional conservation center that contracts their services to museums.

Training, Other Qualifications, and Advancement

Employment as an archivist, conservator, or curator usually requires graduate education and related work experience. Many archivists and curators work in archives or museums while completing their

formal education, to gain the “hands-on” experience that many employers seek when hiring.

Employers usually look for archivists with undergraduate and graduate degrees in history or library science, with courses in archival science. Some positions may require knowledge of the discipline related to the collection, such as business or medicine. An increasing number of archivists have a double master's degree in history and library science. There are currently no programs offering bachelor's or master's degrees in archival science. However, approximately 65 colleges and universities offer courses or practical training in archival science as part of history, library science, or another discipline. The Academy of Certified Archivists offers voluntary certification for archivists. Certification requires the applicant to have experience in the field and to pass an examination offered by the Academy.

Archivists need research and analytical ability to understand the content of documents and the context in which they were created, and to decipher deteriorated or poor quality printed matter, handwritten manuscripts, or photographs and films. A background in preservation management is often required of archivists since they are responsible for taking proper care of their records. Archivists also must be able to organize large amounts of information and write clear instructions for its retrieval and use. In addition, computer skills and the ability to work with electronic records and databases are increasingly important.

Many archives are very small, including one-person shops, with limited promotion opportunities. Archivists typically advance by transferring to a larger unit with supervisory positions. A doctorate in history, library science, or a related field may be needed for some advanced positions, such as director of a State archive.

For employment as a curator, most museums require a master's degree in an appropriate discipline of the museum's specialty—art, history, or archaeology—or museum studies. Many employers prefer a doctoral degree, particularly for curators in natural history or science museums. Earning two graduate degrees—in museum studies (museumology) and a specialized subject—gives a candidate a distinct advantage in this competitive job market. In small museums, curatorial positions may be available to individuals with a bachelor's degree. For some positions, an internship of full-time museum work supplemented by courses in museum practices is needed.

Curatorial positions often require knowledge in a number of fields. For historic and artistic conservation, courses in chemistry, physics, and art are desirable. Since curators—particularly those in small museums—may have administrative and managerial responsibilities, courses in business administration, public relations, marketing, and fundraising also are recommended. Similar to archivists, curators need computer skills and the ability to work with electronic databases. Curators also need to be familiar with digital imaging, scanning technology, and copyright infringement, since many are responsible for posting information on the Internet.

Curators must be flexible because of their wide variety of duties. They need to design and present exhibits and, in small museums, manual dexterity to build exhibits or restore objects. Leadership ability and business skills are important for museum directors, while marketing skills are valuable for increasing museum attendance and fundraising.

In large museums, curators may advance through several levels of responsibility, eventually to museum director. Curators in smaller museums often advance to larger ones. Individual research and publications are important for advancement in larger institutions.

Museum technicians usually need a bachelor's degree in an appropriate discipline of the museum's specialty, museum studies training, or previous museum work experience, particularly in exhibit design. Similarly, archives technicians usually need a bachelor's degree in library science or history, or relevant work experience. Technician positions often serve as a stepping stone for individuals interested in archival and curatorial work. With the exception of small museums, a master's degree is needed for advancement.

When hiring conservators, employers look for a master's degree in conservation, or in a closely related field, and substantial experience. There are only a few graduate programs in museum conservation techniques in the United States. Competition for entry to these programs is keen; to qualify, a student must have a background in chemistry, archaeology or studio art, and art history, as well as work experience. For some programs, knowledge of a foreign language is also helpful. Conservation apprenticeships or internships as an undergraduate can also enhance one's admission prospects. Graduate programs last 2 to 4 years; the latter years include internship training. A few individuals enter conservation through apprenticeships with museums, nonprofit organizations, and conservators in private practice. Apprenticeships should be supplemented with courses in chemistry, studio art, and history. Apprenticeship training, although accepted, usually is a more difficult route into the conservation profession.

Relatively few schools grant a bachelor's degree in museum studies. More common are undergraduate minors or tracks of study that are part of an undergraduate degree in a related field, such as art history, history, or archaeology. Students interested in further study may obtain a master's degree in museum studies. Colleges and universities throughout the country offer master's degrees in museum studies. However, many employers feel that, while museum studies are helpful, a thorough knowledge of the museum's specialty and museum work experience are more important.

Continuing education, which enables archivists, curators, conservators, and museum technicians to keep up with developments in the field, is available through meetings, conferences, and workshops sponsored by archival, historical, and museum associations. Some larger organizations, such as the National Archives, offer such training in-house.

Job Outlook

Competition for jobs as archivists, curators, museum technicians, and conservators is expected to be keen as qualified applicants outnumber job openings. Graduates with highly specialized training, such as master's degrees in both library science and history, with a concentration in archives or records management, and extensive computer skills should have the best opportunities for jobs as archivists. A curator job is attractive to many people, and many applicants have the necessary training and subject knowledge; but there are only a few openings. Consequently, candidates may have to work part time, as an intern, or even as a volunteer assistant curator or research associate after completing their formal education. Substantial work experience in collection management, exhibit design, or restoration, as well as database management skills, will be necessary for permanent status. Job opportunities for curators should be best in art and history museums, since these are the largest employers in the museum industry.

The job outlook for conservators may be more favorable, particularly for graduates of conservation programs. However, competition is stiff for the limited number of openings in these programs, and applicants need a technical background. Students who qualify and successfully complete the program, have knowledge of a foreign language, and are willing to relocate, will have an advantage over less qualified candidates.

Employment of archivists, curators, museum technicians, and conservators is expected to increase about as fast as the average for all occupations through 2008. Jobs are expected to grow as public and private organizations emphasize establishing archives and organizing records and information, and as public interest in science, art, history, and technology increases. However, museums and other cultural institutions are often subject to funding cuts during recessions or periods of budget tightening, reducing demand for archivists and curators during these times. Although the rate of turnover among archivists and curators is relatively low, the need to replace workers who leave the occupation or stop working will create some additional job openings.

Earnings

Median annual earnings of archivists, curators, museum technicians, and conservators in 1998 were \$31,750. The middle 50 percent earned between \$23,090 and \$43,840. The lowest 10 percent earned less than \$16,340 and the highest 10 percent earned more than \$63,580. Median annual earnings of archivists, curators, museum technicians, and conservators in 1997 were \$28,400 in museums and art galleries.

Earnings of archivists and curators vary considerably by type and size of employer, and often by specialty. Average salaries in the Federal Government, for example, are usually higher than those in religious organizations. Salaries of curators in large, well-funded museums can be several times higher than those in small ones.

The average annual salary for all museum curators in the Federal Government in nonsupervisory, supervisory, and managerial positions was about \$59,200 in 1999. Archivists averaged \$57,500; museum specialists and technicians, \$40,400; and archives technicians, \$40,000.

Related Occupations

The skills that archivists, curators, museum technicians, and conservators use in preserving, organizing, and displaying objects or information of historical interest are shared by anthropologists, arborists, archaeologists, botanists, ethnologists, folklorists, genealogists, historians, horticulturists, information specialists, librarians, paintings restorers, records managers, and zoologists.

Sources of Additional Information

For information on archivists and on schools offering courses in archival studies, contact:

☛ Society of American Archivists, 527 South Wells St., 5th floor, Chicago, IL 60607-3922. Internet: <http://www.archivists.org>

For general information about careers as a curator and schools offering courses in museum studies, contact:

☛ American Association of Museums, 1575 I St. NW., Suite 400, Washington, DC 20005. Internet: <http://www.aam-us.org>

For information about conservation and preservation careers and education programs, contact:

☛ American Institute for Conservation of Historic and Artistic Works, 1717 K St. NW., Suite 301, Washington, DC 20006.

Internet: <http://palimpsest.stanford.edu/aic>

College and University Faculty

(O*NET 31202, 31204, 31206, 31209, 31210, 31212, 31114, 31216, 31218, 31222, 31224, 31226, and 31299)

Significant Points

- A Ph.D. is usually required for full-time, tenure-track positions in 4-year colleges and universities.
- Applicants for full-time college faculty positions should expect to face keen competition.
- Job prospects will continue to be better in certain fields—computer science, engineering, and business, for example—that offer attractive nonacademic job opportunities and attract fewer applicants for academic positions.

Nature of the Work

College and university faculty teach and advise nearly 15 million full- and part-time college students and perform a significant part of our Nation's research. Faculty also keep up with developments in their field and consult with government, business, nonprofit, and community organizations.

Faculty usually are organized into departments or divisions, based on subject or field. They usually teach several different courses—algebra, calculus, and statistics, for example. They may instruct undergraduate or graduate students, or both. College and university faculty may give lectures to several hundred students in large halls, lead small seminars, or supervise students in laboratories. They prepare lectures, exercises, and laboratory experiments; grade exams and papers; and advise and work with students individually. In universities, they also supervise graduate students' teaching and research. College faculty work with an increasingly varied student population made up of growing shares of part-time, older, and culturally and racially diverse students.

Faculty keep abreast of developments in their field by reading current literature, talking with colleagues, and participating in professional conferences. They also do their own research to expand knowledge in their field. They perform experiments; collect and analyze data; and examine original documents, literature, and other source material. From this process, they arrive at conclusions, and publish their findings in scholarly journals, books, and electronic media.

College and university faculty increasingly use technology in all areas of their work. In the classroom, they may use computers—including the Internet; electronic mail; software programs, such as statistical packages; and CD-ROMs—as teaching aids. Some faculty use closed-circuit and cable television, satellite broadcasts, and video, audio, and Internet teleconferencing to teach courses to students at remote sites. Faculty post course content, class notes, class schedules, and other information on the Internet. They also use computers to do research, participate in discussion groups, or publicize professional research papers. Faculty will use these technologies more as quality and affordability improve.

Most faculty members serve on academic or administrative committees that deal with the policies of their institution, departmental matters, academic issues, curricula, budgets, equipment purchases, and hiring. Some work with student and community organizations. Department chairpersons are faculty members who usually teach some courses but usually have heavier administrative responsibilities.

The proportion of time spent on research, teaching, administrative, and other duties varies by individual circumstance and type of institution. Faculty members at universities normally spend a significant part of their time doing research; those in 4-year colleges, somewhat less; and those in 2-year colleges, relatively little. The teaching load, however, often is heavier in 2-year colleges and somewhat lower at 4-year institutions. Full professors at all types of institutions usually spend a larger portion of their time conducting research than assistant professors, instructors, and lecturers.



College and university faculty teach, conduct research, and write scholarly papers.